

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 89-159 are pending in the application, with claims 89, 101, 125 and 136 being the independent claims. Claims 79-88 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. New claims 89-159 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested. Support for new claims 89-159 can be found throughout the specification, especially at page 45, line 27 to page 47, line 17; page 69, line 1 to page 71, line 37; and throughout the claims as originally filed.

Added claims 125-159 are method claims similar to the method claims that the Examiner grouped with the composition claims in the Restriction Requirement dated October 2, 2003. Therefore, it is respectfully submitted that claims 125-159 (the method claims) should be examined together with claims 89-124 (the composition claims).

Based on the above amendments and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Applicants also respectfully remind the Examiner that, in view of the amendments and remarks presented herein, that the present claims "would not have been properly finally rejected on the grounds and art of record in the next Office Action." M.P.E.P. § 706.07(b). Therefore, Applicants respectfully submit that the issuance of a final Office Action after the filing of the present Amendment and Reply and the Request for Continued Examination, filed concurrently herewith, would be improper.

Rejections under 35 U.S.C. § 112

The rejection under 35 U.S.C. § 112 of the term "effective amount" in claims as allegedly not defining for what it is effective for, and is a relative term which renders the claim indefinite is being maintained. *See* Advisory Action, dated November 1, 2005, at page 2; Final Office Action dated April 26, 2005, at pages 6-7. Applicants respectfully traverse this rejection.

In an attempt to expedite prosecution and not in acquiescence to the rejection, Applicants have cancelled claims 79-88 and have not included the limitation "effective amount" in new claims 89-124. However, Applicants have included the term "effective amount" in new method claims 125-159. It is Applicants' belief that the Examiner should find this acceptable because including an "effective amount" in the method claims does "require the amount of the polypeptide of the claims, to be a therapeutic, or protective amount to achieve the induction of an immune response that prevents, treats or ameliorates disorders or diseases." *See* Advisory Action dated November 1, 2005, page 2. Moreover, as the Examiner is aware, use of the term "effective amount" is accepted standard practice for therapeutic method claims. Thus, based on the amendments presented above, Applicants respectfully request removal of the rejection under 35 U.S.C. § 112.

Rejections under 35 U.S.C. § 102(b)

The rejection of claims 79, 80, 82, 83, 84 and 86 under 35 U.S.C. § 102(b) as being anticipated by Tomb *et al.* (1997) is being maintained. Applicants respectfully traverse this rejection.

In an attempt to expedite prosecution and not in acquiescence to the rejection, Applicants have cancelled the previously pending claims without prejudice and replaced them with new claims to an HP30 polypeptide of *Helicobacter* spp. or a polypeptide derived from HP30 of *Helicobacter pylori* and one or more adjuvants. Furthermore, Applicants have added new claims to a method of administering the HP30 polypeptide or an HP30-derived polypeptide to reduce or prevent *Helicobacter* spp. colonization. To qualify as prior art under 35 U.S.C. § 102(b), a reference must teach each and every element of a claim. See MPEP 2131 citing *Verdegaal Brothers v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). Tomb *et al.* (1997) does not teach combining the polypeptide with an adjuvant. Furthermore, Tomb *et al.* does not teach using an HP30 polypeptide to reduce or prevent *Helicobacter* spp. colonization. Thus, Applicants respectfully request the rejection under 35 U.S.C. § 102(b) over Tomb *et al.* (1997) be withdrawn.

Rejections under 35 U.S.C. § 103

The rejection of claims 85 and 88 under 35 U.S.C. § 103(a) as being unpatentable over Tomb *et al.* in view of WO 96/40893 (1996)(hereafter referred to as "Smith *et al.*") is being maintained. Applicants respectfully traverse this rejection.

As mentioned above, in order to expedite prosecution and not in acquiescence to the rejection, Applicants have cancelled claims 79-88 and have added new claims. However, inasmuch as the new claims incorporate the language from now cancelled claims 85 and 88 to which the Examiner rejected, Applicants respectfully traverse the rejection with the following arguments.

A proper obviousness analysis under § 103 was clarified by the Federal Circuit in *In re Vaeck*. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). In *Vaeck*, the Federal Circuit stated:

Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success.

Id. at 493. The court stated further that "[b]oth the suggestion and the reasonable expectation of success must be found in the prior art, not in the applicants disclosure. *Id.* at 493. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994). Moreover, even if a prior art genus contains only a small number of members, there is still no *per se* rule of obviousness for each member. *See* MPEP 2144.08. Some motivation to select the claimed species or subgenus must be taught by the prior art. *See In re Deuel*, 51 F.3d 1552, 1558-59, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995).

One of ordinary skill in the art would not have been motivated to arrive at the claimed subject matter from Tomb *et al.* in view of Smith *et al.* with a reasonable expectation of success for the following reasons.

Tomb *et al.* sequenced the genome of *Helicobacter pylori* strain 26695 and identified 1590 predicted open reading frames (ORFs), one of which (HP1588) was identified as potentially encoding an amino acid sequence having homology with SEQ ID NO:4. However, as the examiner has admitted, Tomb *et al.* does not teach or suggest

which of the 1590 predicted ORFs would encode a polypeptide that is potentially useful as a vaccine candidate, nor how to test any particular polypeptide for efficacy. Indeed, there is absolutely nothing in Tomb *et al.* to suggest that there is anything special about HP1588, as opposed to one of the other 1589 putative OFRs disclosed therein, such that one of ordinary skill would have been motivated to clone HP1588 and to express the encoded polypeptide with the expectation that, when combined with an adjuvant, the polypeptide would reduce or prevent *H. pylori* colonization. In fact, as discussed in more detail below, not only was there no motivation to select the HP30 polypeptide out of the very large number of encoded-polypeptides disclosed in Tomb *et al.* and combine it with an adjuvant, when Tomb *et al.* is taken with Smith *et al.*, there is a teaching away from using what Smith *et al.* has labeled "other cytoplasmic proteins" as vaccine candidates.

Similar to the Tomb *et al.* "shot-gun" sequencing effort, Smith *et al.* identified more than 900 putative *H. pylori* OFRs. Specifically, one particular coding sequence "12ge20305orf30" disclosed in Smith *et al.* shares homology with the HP30 coding sequence of SEQ ID NO:3. Smith *et al.* identified 12ge20305orf30 as encoding one of the "other cytoplasmic proteins." See Table 2, page 41. In the section entitled "Specific Example: Determination Of Candidate Protein Antigens For Antibody And Vaccine Development," Smith *et al.* provides a procedure for selecting candidate proteins for vaccine development. See WO96/40893, page 72, line 25 to page 73, line 73. Within this example, Smith *et al.* states that "the ORF's can be analyzed for homology to other known exported or membrane proteins. . . ." Furthermore, Smith *et al.* states that "ORF amino acid sequences identified as exported or membrane associated by this algorithm

are likely protein antigens for vaccine development." Thus, Smith *et al.* teaches that candidates for vaccine development should be exported or membrane associated proteins, not those he classified as "other cytoplasmic proteins."

In fact, Smith *et al.* only expressed 10 (none of which he had labeled as an "other cytoplasmic protein") of the over 900 OFRs identified based on homologies to known proteins and based on predicted exposure to extracellular contact. See WO96/40893, page 102, lines 23-28 and Table 5, page 100. Of these ten "vaccine candidates," nine were actually tested, and only 3 demonstrated a significant immunoprotective effect. See WO96/40893, Fig. 3 and Fig. 4 and page 105, lines 1-28. Thus, given the fact that only 3 out of 9 of the polypeptides that were identified from the most promising vaccine candidates actually worked, it is clear that there would not have been a reasonable expectation that "12ge20305orf30", which Smith *et al.* did not even label as encoding a promising polypeptide, would in fact provide immunoprotective effects as demonstrated by the present inventors. In fact, not only would there have been no reasonable expectation of success, it is clear in light of the discussion above that Smith *et al.* teaches away from the presently claimed invention.

As the Examiner will recognize, while claims 125-159 are directed to methods of preventing or reducing *Heliobacter* spp. colonization, claims 89-124 are directed to compositions. The Examiner has argued that recitation of an intended use in a composition claim does not impart patentability to an otherwise known composition. However, Applicants submit that claims 89-124 are not directed to a known composition. For the reasons provided above, the combination of references relied on by the examiner

provide no motivation, and in fact teach away, from formulating a composition comprising HP 30 and one or more adjuvants.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: May 26, 2006

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